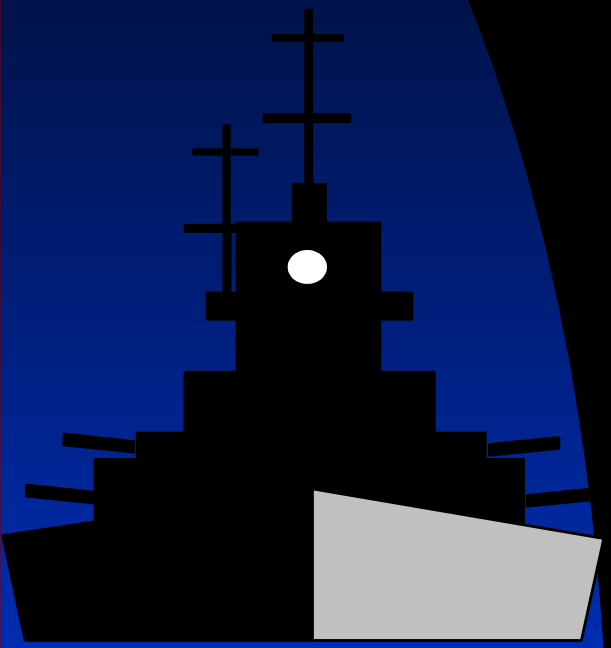
Chemical, Biological, and Radiological Defense



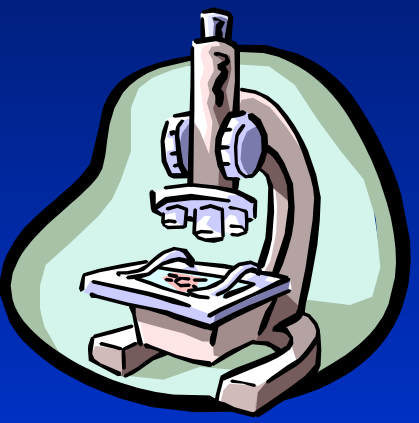
Presented by: UT1 (SCW) Kain, Michael

Introduction

- The Why of CBR Training
- WWI – Chemical Warfare Threat
- WWII – Nuclear Threat
- Present – Threat of all 3 put Navy into motion for Positive Defensive Posture against CBR

US National Policy

- The US is prohibited from first strike against against attacking nations with **chemical** agents
- Authority must come from the President of the United States for countermeasures
- United States **WILL NOT USE** Biological Agents including toxins
- All Biological research programs are used only for vaccines, antidotes, etc.



Learning Objectives 1

- Recognize Chemical, Biological, and Radiological (CBR) Attack Methods
- Recognize the Need for CBR Defense
- Identify Terms Used With CBR

Purpose of CBR Weapons

Weapons of Mass Destruction

NUCLEAR

- Mass Destruction
  - Targets and Personnel
  - Produce Explosions of Great Force and Heat
  - Produces Nuclear Radiation
  - (Mega Death = 10,000+)

BIOLOGICAL

- Mass Casualties

  - Personnel, Livestock, and/or Crops

  - Microorganisms, Fungi, Toxins, and Microtoxins to cause diseases or cause other casualties

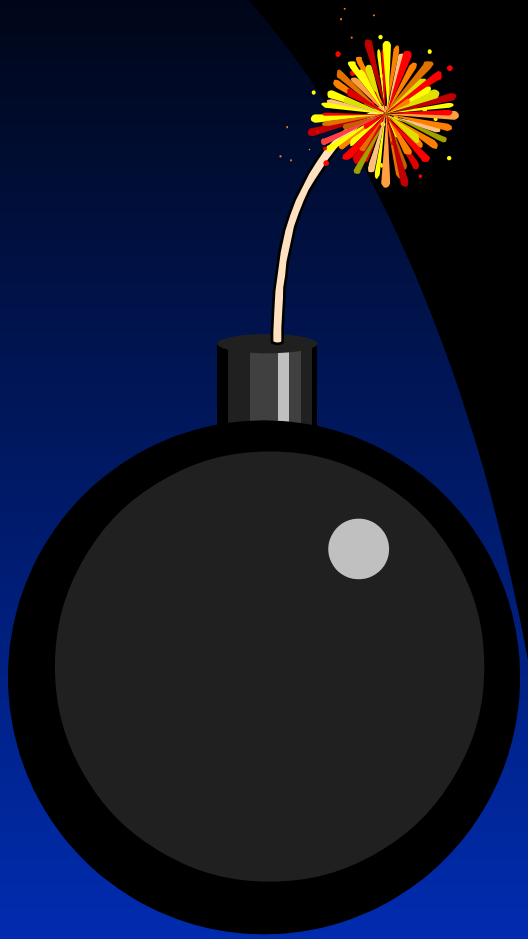
CHEMICAL

- Mass Casualties

  - Personnel, Livestock, and/or Crops

  - Kill or disable personnel by affecting their blood, nerves, eyes, skin, lungs, or stomach

METHODS



- Nuclear

  - Bombs, Missiles, Projectiles, etc.
- Chemical

  - Limited to certain types according to chemical make-up
- Biological

  - Aerosols are most probable

Chemical Warfare

Learning Objectives 2

- Identify terms used with Chemical Warfare (CW)
- Identify types of CW
- Identify the of effects of CW agents
- Identify Self-Aid and First-Aid methods for countering nerve, blister, and choking agents

2 Types of CW

1. Casualty CW Agents
   - Death
   - Severe Incapacitation
   - Classified as Persistent or No persistent
   - Blood, Blister, Choking, or Nerve Agents
   - Cumulative (1+1=?) according to dosage

2. Incapacitating CW Agents

- Temporarily disable
- Produce physiological and/or psychological (Head vs. Mind)
- Riot Control Agents (RCA’s)

EFFECTS

- Nerve
- Blister
- Blood
- Choking
- Riot Control Agents

Nerve Agents

MILD SYMPTOMS	SEVERE SYMPTOMS
• Unexplained runny nose • Unexplained sudden headache • Excessive sudden drooling • Difficulty seeing (reduced vision or miosis) • Tightness in chest, difficulty breathing • Localized sweating and muscular twitching in the area of contaminated skin • Stomach cramps • Nausea	• Strange or confused behavior • Wheezing, difficult, or labored respiration and cough • Severely pinpointed pupils • Red eyes with tearing • Vomiting • Severe muscular twitching and general weakness • Involuntary urination and defecation • Convulsions • Unconsciousness • Respiratory failure

Blister Agents
(AKA Mustard)

- Attacks Moist Parts of Body
- Inside:
- Lungs
- Mucous membranes
- Eyes
- Outside:
- Neck
- Genitals
- Groin
- Armpits
- Bends of knees and elbows

Blood Agents

INITIAL SYMPTOMS	ADVANCED SYMPTOMS
• Increased respiration • Headache • Giddiness • Dizziness • Increased pulse rate • Red, flushed skin	• Convulsions • Coma • Death

Choking Agents

- Affects the respiratory system by filling lungs with fluid
- Immediate dryness of throat
- Coughing
- Choking
- Tightness of Chest
- Headache
- Nausea
- Irritated and watery eyes

Riot Control Agents (RCA)

SYMPTOMS OF TEAR AGENTS	SYMPTOMS OF VOMITING AGENTS
• Violent burning sensation of the eyes • Reddening of the eyelids • Uncontrollable winking • Excessive tearing • Intolerance to light • Burning sensation of the throat, with developing pain and a sensation of choking • Sneezing • Nausea • Diarrhea • Headache • Burning sensation of the skin	• Irritation of the eyes, mucous membranes of the mouth and nose • Runny nose, sneezing, and coughing • Headache • Tightness and pain in the chest • Nausea and vomiting

Biological Warfare

Learning Objectives 3

- Recall the Terms Used With Biological Warfare (BW)
- Identify the Types of BW
- Identify the Effects of BW

Defined:

The intentional use of living organisms, toxins, and micro toxins to disable or to destroy people and domestic animals, damage crops, or deteriorate supplies.

TYPES

Disease (common name)	Causative Agent	Physiological Effects	Time to effect
Anthrax	Bacillus anthracis	Mild fever and fatigue, worsening to severe respiratory disorders, high fever and excessively rapid pulse rate. Death can occur within 5-12 days of exposure if left untreated. Pulmonary anthrax is fatal more than 90% of the time.	1-5 days
Plague	Yersinia pestis	Fever, headache, and rapid heart rate, followed by pneumonia and hemorrhaging in the skin and mucous membranes. Untreated plague pneumonia fatalities approach 100%, but early treatment can reduce mortality to as low as 5%.	2-3 days
Tularemia	Francisella tularensis	Symptoms include fever, chills, headache and muscular pain. Untreated tularemia can result in 30-60% mortality; treated, the mortality rate is reduced to 1%.	3-5 days
Botulinum Toxin	Clostridium botulinum	Initial symptoms include extreme weakness, nausea, headaches, and intestinal pain leading to respiratory paralysis that may cause death.	2-26 hours

Advantages

- Least expensive CBR agent to produce and buy
- Toxins and Micro toxins are hundreds to thousands times stronger than today's chemical weapons

Disadvantages

- Environment critical
- Not easy to use/distribute

Methods of Deployment

- Vectors
- Aerosols
- Food
- Water

Symptoms

- Fever – First Indication
  - Measures degree of severity
- Malaise – Feeling of bodily discomfort and weakness
- Inflammation – Caused by bodies tissue combating the disease

Nuclear Warfare

Learning Objectives 4

- Identify the Types of Nuclear Warfare
- Identify the Effects of Nuclear Weapons

More Bang for the Buck

There is no difference between nuclear weapons and ordinary high explosive weapons except for the size of destruction and added effects of nuclear radiation.

Blast Classifications

- High Altitude Blast: 100,000+ feet
  - Destroy Communications with EMP
- Air Blast: 100,000- feet
  - Cause Structural Damage with Expansion and Compression
- Surface Blast: The Fire Touches Earth (Ground Zero)
  - Shockwave, Blast wave, Intense Fire, & Nuclear Fallout
- Subsurface (Underwater) Blast:
  - Water Does Most of the Damage

Contamination, Detection, & Identification

Learning Objectives 5

- Identify the Purpose of CBR monitoring and decontamination teams
- Identify markers used to indicate CBR contamination
- Recall the purpose of the markers used to indicate CBR contamination

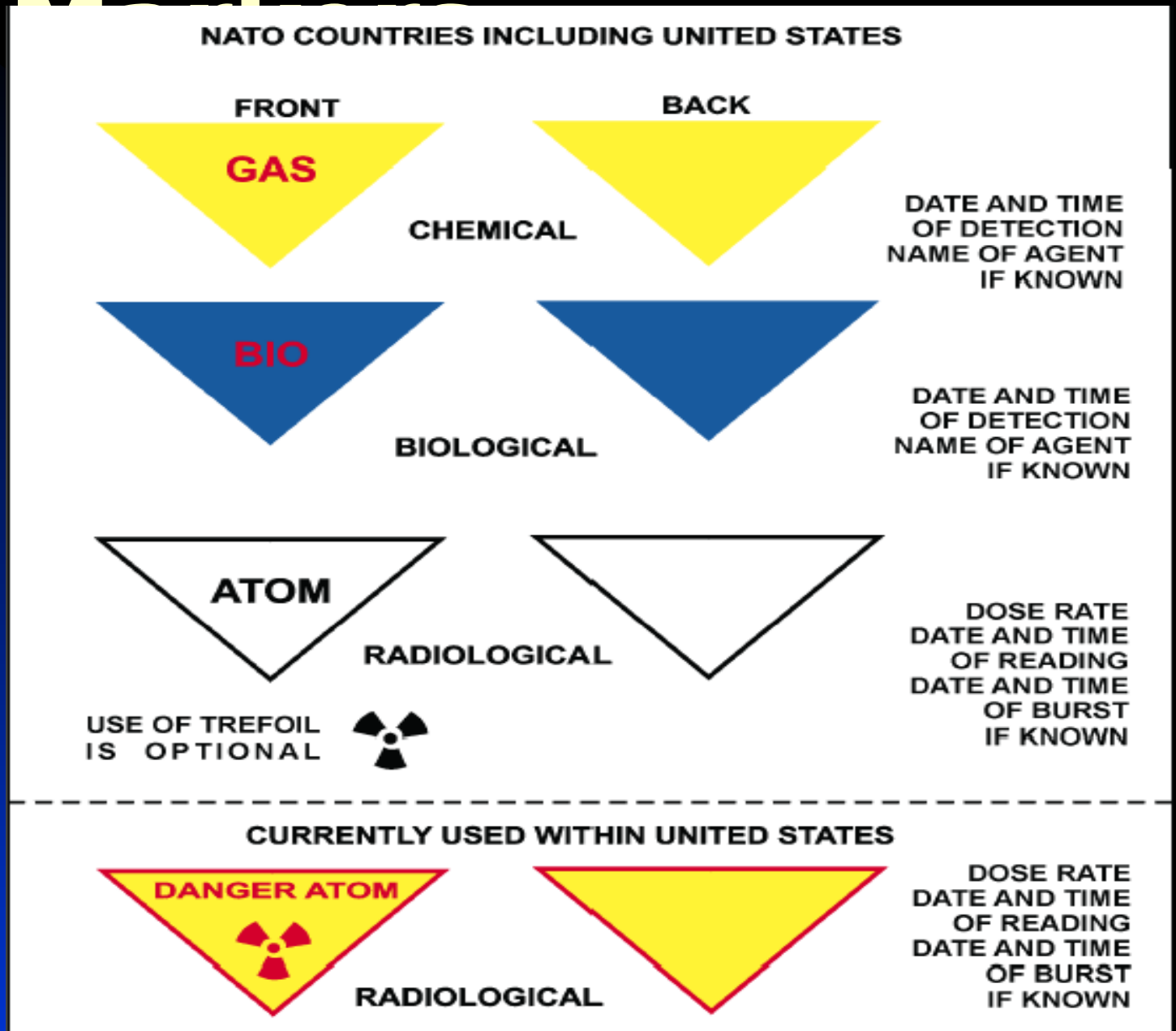
Purpose

After an attack, what is the extent of the damage?

Survey Teams

- Monitor – Head of the team and carries detection equipment
- Recorder – Maintains record of all readings, including time, location, and specific hazard
- Messenger – Reports to Damage Control Central

CBR Contamination Markers



Types of Detection Equipment

- Radioactive
  - Self Reading Pocket Dosimeter
  - DT-60/PD
- Biological
  - Lab Sampling (Medical)
- Chemical
  - M256A1
  - M8 and M9 Liquid Chemical Agent Papers

CBR Protective Measures

Learning Objective 6

- Recognize the procedures to follow in case of a CBR attack

What to do in a CBR attack

- Nuclear Attack

  - Get below and behind and remain till the all clear is given

  - Have mask ready

- BW or CW Attack

  - Avoid the spray, mist or cloud

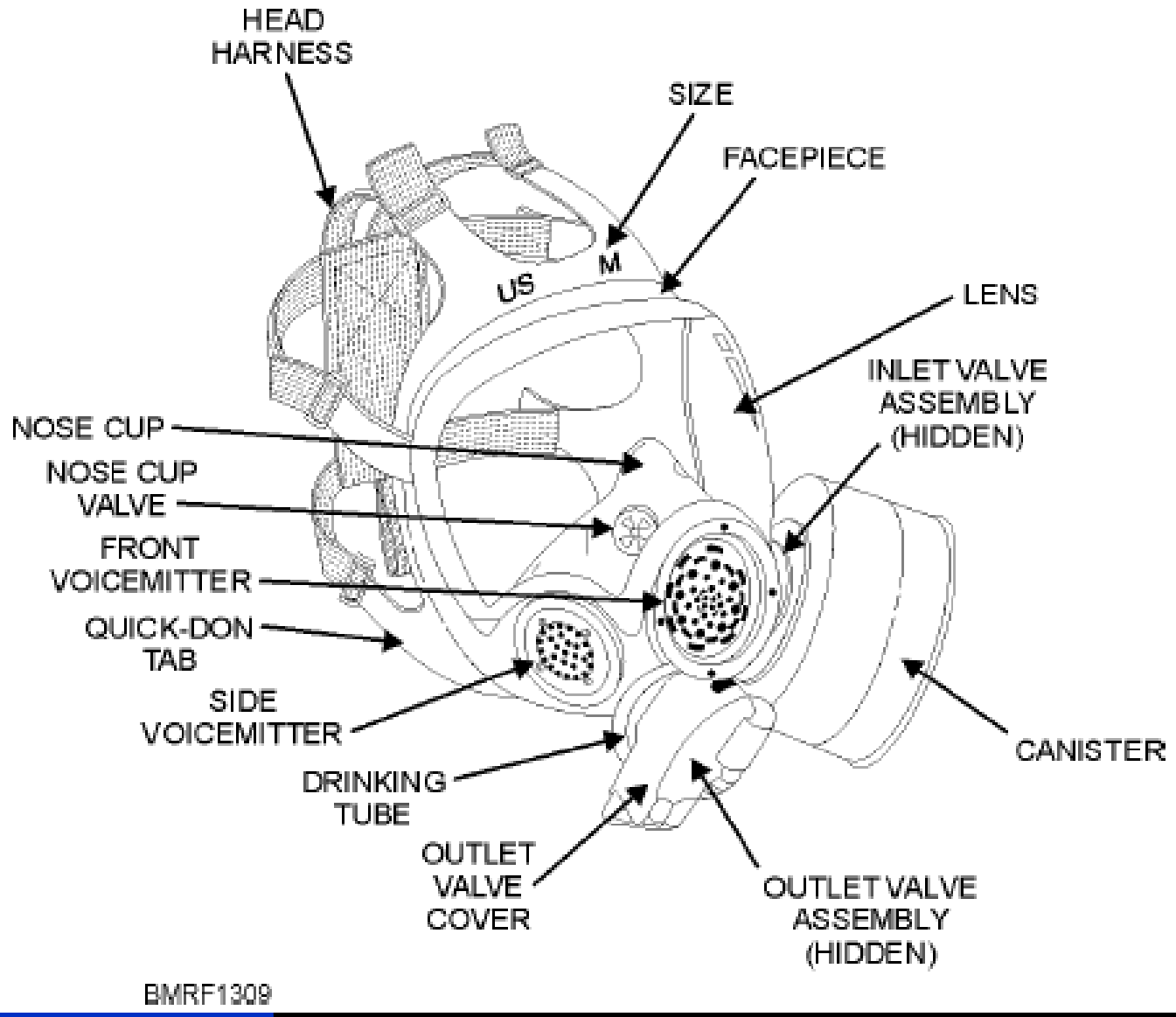
  - Wear your mask

  - Seek shelter and cover the body

  - Assume all areas are contaminated

  - Get to Decon

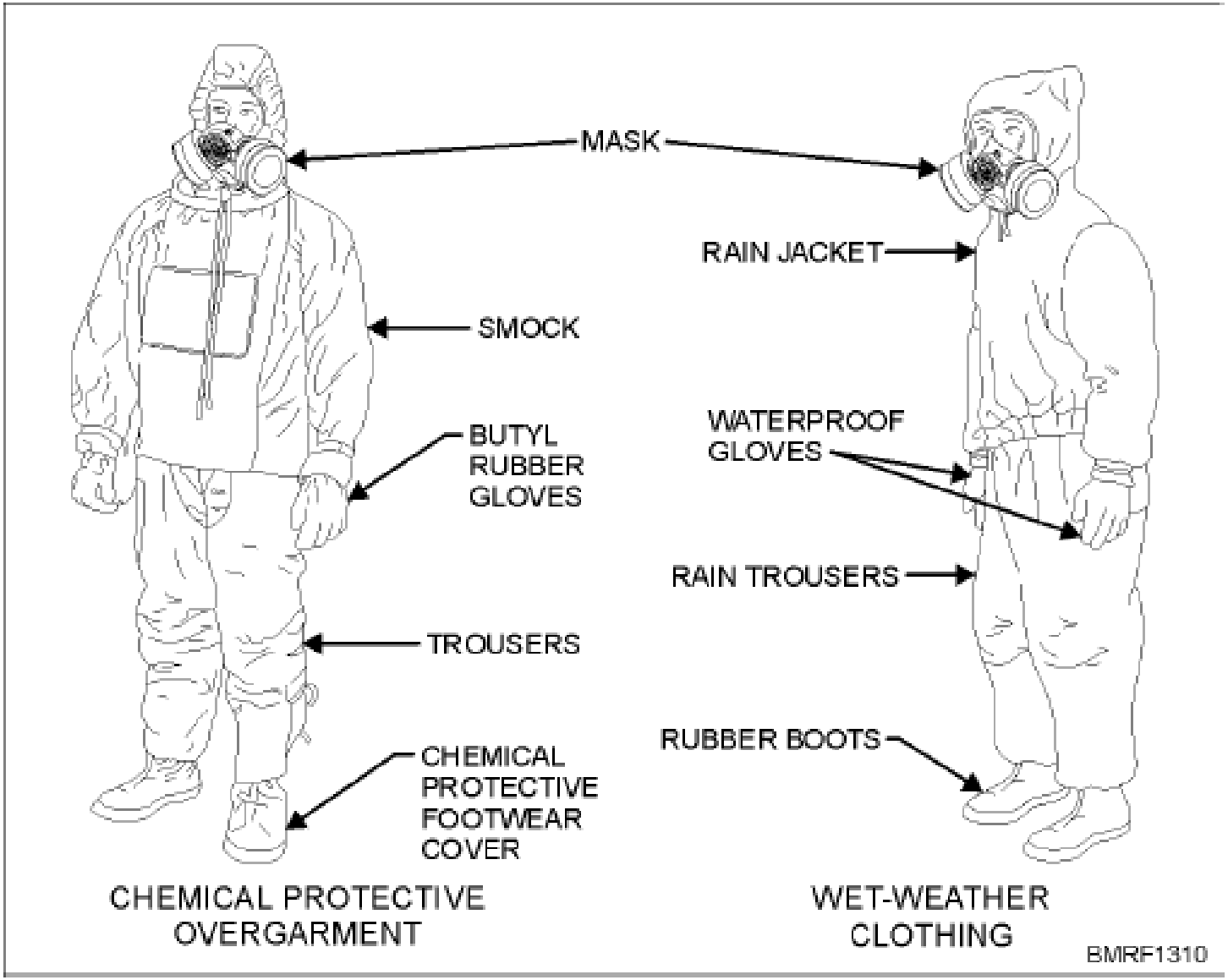
MCU-2/P


HEAD HARNESS
SIZE
FACEPIECE
US
M
LENS
INLET VALVE ASSEMBLY (HIDDEN)
NOSE CUP
NOSE CUP VALVE
FRONT VOICEMITTER
QUICK-DON TAB
SIDE VOICEMITTER
DRINKING TUBE
OUTLET VALVE COVER
OUTLET VALVE ASSEMBLY (HIDDEN)
CANISTER
BMRF1309

MCU-2/P (cont.)

- When you hear the alarm for a CBR attack:
- STOP breathing
- You should only need 10 seconds
- Decon face and eyes if needed first
- Does not produce oxygen
- Protects against all known CBR agents

CPO Suit, Boots &



Mission Oriented Protective Posture (MOPP)

Learning Objective 7

- Recall the procedures for protection at each level of Mission Oriented Protective Posture (MOPP)

MOPP Levels

- Level-1
  - Equipment at the ready and stowed
- Level-2
  - CPU-2/P w/canister in carrier and worn on person
- Level-3
  - Don Trousers and Smock (hood down)
  - Don Boots
  - Carry Gloves, M291Personal decon kit, and med. Kit
  - Fit new filter to CPU-2/P
- Level-4
  - Don CPU-2/P

DAMAGE CONTROL

- DC IS EVERYONES RESPONSIBILITY
- WHAT ARE THE TWO ORGANIAZAITONS THAT DEALS WITH DAMAGE CONTROL?
- ADMINISTRATION & BATTLE
- WHEN IS MATERIAL READINES ACCOMPLISHED?
- WHEN DC FITTINGS AND EQUIPMENT ARE AVAILABLE AND WORKING RIGHT IN AN EMERGENCY.

DC

- WHO IS RESPONSIBLE FOR MAINTAINING PROPERLY TRAINING DCPOS REPAIR PARTIES, AND REPAIR LOCKERS?
- ENGINEERING OFFICER
- DCA COORDINATES ALL EFFORTS

DC RESPONSIBILITIES

- CO: OVERALL RESPONSIBLE
- XO: CONSIDERED THE SENIOR PERSON ASSIGNED TO THE DAMAGE CONTROL TRAINING TEAM (DCTT)
- REMEMBER DCCT IS RESPONSIBLE FOR ALL DRILLS AND EXERCISES

DCCT

- DCCT EVALUATES AND CRITIQUES YOUR DC TEAMS.
- ENGINEER OFFICER: SHIPS DC OFFICER. REVIEWS ALL ADMIN ITEMS DONE BY THE DCA
- DCA (DAMAGE CONTROL OFFICER): PRIMARY ASSISTANT TO THE DCO.

RESPONSIBLITIES

- DCA IS RESPONSIBLE FOR ALL DCCT MEMBERS, DRILLS, REPAIR PARTIES, ALL HANDS.
- REMEMBER THEY ADMINSTER THE BILLETS FOR THE DCPO, GAS FREE ENGINEER, FIRE MARSHAL, AND DC CENTRAL

DCPO

- MUST HAVE COMPLETED PQS, EACH WORK CENTER HAS ONE, (THE XO MUST GIVE FINAL APPROVAL ON QUALS).
- RESPONSIBLE FOR?
- ALL PHASES OF SHIPS DC, FIREFIGHTING, SUPERVISING SETTING OF MATERIAL CONDITIONS, WEIGHS CO2 BOTTLES, ALL COMPARTMENTS ARE PROPERLY CODED, POST SAFETY NOTICES, ASSIST DIVO IN INSPECTING SPACES

GFE AND FIRE MARSHALL

- MUST BE A CPO OR ABOVE.
- RESPONSIBLE FOR SAFE ENTERING OF SPACES AND VOIDS.
- FIRE MARSHALL
- RESPONSIBLE FOR HOUSEKEEPING, SAFETY, SMOKING, VARIOUS OTHER ITEMS.

DC CENTRAL

- PURPOSE IS TO COLLECT AND COMPARE REPORTS FROM REPAIR STATIONS TO MAKE CORRECTIVE ACTIONS.
- THIS IS THE NERVE CENTER OF THE DC ORGANIZATION.
- MAKES REPORTS TO CENTRAL CONTROL STATIONS (CCS)

REPAIR PARTIES

- ALL SHIPS MUST HAVE A MINIMUM OF HOW MANY REPAIR PARTIES?
  - 3– REPAIR 2, 3, AND 5
- IN PORT EMERGENCY TEAM (IET)
- DUTY SECTION PERSONNEL
- RESCUE AND ASSISTANCE
- ALL SHIPS HAVE FOR SEA/PORT

DC

- RAPID RESPONSE TEAM GOES DIRECTLY TO THE SCENE WHEN THERE IS A FIRE OR EMERGENCY.
- GENERAL QUARTERS (GQ)
- ALL HANDS EVOLUTION AND IS THE “HIGHEST” STATE OF READINESS. ALL LOCKERS MANNED. DON BATTLE DRESS.

DC

- WHERE IS THE BATTLE STATION FOR THE DCA?
- DCC OR CSS
- ALARM: HEARD OVER THE ONE MC. NAME SOME OF THEM?
- COLLISION, CHEMICAL ATTACK, GENERAL, FLIGHT CRASH

ALARMS

- COLLISION SET WHAT MATERIAL CONDITION?
- ZEBRA
- GQ YOU SET WHAT MATERIAL CONDITION?
- ZEBRA

MATERIAL CONDITION

- NAME THE THREE MATERIAL CONDITIONS?
- XRAY-LEAST WATERTIGHT INTEGRITY, EASE OF ACCESS. ALL BLACK X AND CIRCLE X SET
- YOKE-BETTER INTEGRITY, SET AT SEA AND IN PORT DURING WARTIME. ALL FITTINGS X, Y, CIRCLE X AND Y CLOSED.

MATERIAL CONDITIONS

- ZEBRA: SET WHEN GQ SOUNDED, ENTERING/LEAVING PORT IN WAR, WHEN CO DEEMS NECESSARY
- SPECIAL CLASSES:
- CIRCLE ZEBRA, OPENED WITH PERMISSION OF CO ONLY.
- DOG ZEBRA: DARKEN SHIP

EEBD

- EMERGENY ESCAPE BREATHING DEVICE: PROVIDES YOU WITH HOW MANY MINUTES OF BREATHABLE AIR?
- 15
- SEED (SUPPLEMENTAL EMERGENY EGRESS DEVICE): FOR WEAR IN ENGINEERING SPACES

OBA

- OXYGEN BREATHING APPARATUS: PRIMARY TOOL USED TO FIGHT FIRES
- WHAT IS THE EFFECTIVE TIME LIMIT?
- 45 MINUTES
- ALWAYS ALLOW HOW MANY MINUTES TO LEAVE AREA?
- 15

DC

- WHAT DEVICE IS REPLACING THE OBA?
- THE SCBA-SELF CONTAINED BREATHING APPARATUS.
- HOW LONG WILL EACH BOTTLE LAST?
- 30 MINUTES FROM TIME ACTIVATED

FIRE FIGHTING

- WHAT IS THE MAIN OBJECTIVE OF FIRE PREVENTION
- TO PREVENT FIRES
- FIRE TRIANGLE: NAME THE THREE ELEMENT?
- OXYGEN, FUEL, HEAT
- DEFINE FLASH POINT?
- LOWEST TEMP, FLAMMABLES GIVE OFF VAPORS THAT WILL FLAME OR SPARK.

FIRE FIGHTING

- DEFINE FIRE POINT:
- TEMP AT WHICH FUEL WILL BURN
- DEFINE IGNITION:
- WILL BURN WITHOUT SPARK OR FLAME, LOWEST TEMP

FIRE FIGHTING

- CONDUCTION, CONVECTION, AND RADIATION
- LOOK IT UP IN CHAPTER 12

CLASSES OF FIRES

- CLASS A:
- WOOD, PAPER, ECT. USE WATER OR FOG PATTERN. CAN USE AFFF
- CLASS B:
- FLAMMABLE LIQUIDS: USE AFFF, HALON OR PKP
- CLASS C:
- ENERGIZED ELECRICAL FIRES:
- USE CO2, HALON, OR WATER SPRY. DEENERGIZE AND HANDLE AS CLASS A.

FIRE FIGHTING

- WHAT IS THE MOST COMMON SIZE OF THE FIRE PLUGS?
- 1 ½ INCH FOR FRIGATES AND SMALLER
- 2 ½ INCH FOR LARGER SHIPS
- WHAT IS THE P-100 PUMP USED FOR?
- FIRE FIGHTING AND SOME DEWATERING

SURVIVAL

- YOUR SURVIVAL AT SEA DEPENDS ON YOUR KNOWLEDGE, SELF CONTROL, TRAINING, AND EQUIPMENT.
- FOR ABANDON SHIP WHAT ARE FOUR ITEMS YOU MUST KNOW?
- BEARING, DISTANCE TO NEAREST LAND, SEA/WIND CONDITIONS, AND WATER TEMP. ALL PASSED OVER THE 1MC

SURVIVAL

- ABANDON SHIP:
- GO OVER THE SIDE FULLY CLOTHED WHEN POSSIBLE.
- TAKE EXTRA GLOVES/CLOTHES
- LEAVE THE SHIP FROM WHICHEVER SIDE OF THE SHIP IS LOWER IN THE WATER.
- LEAVE BY THE WINDWARD SIDE IF POSSIBLE

SURVIVAL

- SWIMMING THROUGH FLAMES:
- DON’T WEAR WHAT TYPE LIFE PRESERVER?
- INHERENTLY BUOYANT
- IF WEARING CO2 LIFE PRESERVER DON’T INFLATE.
- WHAT ARE THE TWO BASIC CATEGORIES FOR FLOTATION DEVICES?
- LIFE PRESERVERS AND LIFEBOATS

SURVIVAL

- THINK COMMAN SENSE, WHICH ONE PROVIDES YOUR GREATEST CHANCE OF SURVIVAL?
- LET’S DISCUSS EQUIPMENT ON LIFE BOATS: CHAPTER 15 PG 10

SURVIVAL STEPS

- THIRST: WITHOUT IT, DEATH OCCURS IN HOW MANY DAYS?
- 8-12
- HOW MUCH WATER DO YOU NEED A DAY?
- 2 QUARTS
- FOOD: DON’T EAT/DRINK WITHIN FIRST 24 HOURS

SURVIVAL

- WITH WATER A PERSON CAN SURVIVE WITHOUT FOOD FOR HOW LONG?
- 4 WEEKS
- MAN OVERBOARD METHODS:
- RESCUE BY HELO: WHAT DEVICES DO THEY USE TO RESUCE MEMBER:
- SLING, NET, TWO PRONG SEAT

GROUND SURVIVAL

- IN A GROUP ESTABLISH LEADER.
- SIGNS OF WATER IN THE DESERT ARE DAMP AREAS, WATCH THE DIRECTION BIRDS FLY.
- REMEMBER APROX 120,000 PLANTS ARE EDIBLE

EVASION

- ABIDE BY THE CODE OF CONDUCT
- EVADE THE ENEMY AT ALL COST.